REMARKS

Applicants respectfully request reconsideration of the above-captioned application. Claims 1-21 are currently pending. Applicants have amended claims 1, 8, 11, 12, 18 and 21 to improve readability and spelling. More specifically, applicants believe that the additional text does not substantively change the scope of the claims insofar as, when read in light of the specification, the previous claims reasonably conveyed the metes and bounds of the application and the additional language merely brings out or emphasizes certain aspects of the invention.

Applicants note with appreciation the indication of allowable subject matter in claims 13-17 and 20.

The Office Action includes a rejection of claims 1-12, 18, 19 and 21 under 35 U.S.C. §102(e) as allegedly being anticipated by the Bourges-Sevenier patent Application Publication (US 2002/0036639); and a rejection of claim 19 under 35 U.S.C. §103 as allegedly being unpatentable over the Bourges-Sevenier patent publication. These rejections are respectfully traversed.

The present invention relates to animation of three-dimensional (3D) graphic models, and more particularly, to apparatuses for compression and reconstruction of an animation path, which is used in animation, using linear approximation, methods of compression and reconstruction used in the apparatus, and data formats for the apparatus and methods.

As explained in the background section of the present application, interpolators are used to express motion and rotation in space, model morphing, color changes, etc. of a 3D modeled object. As explained at page 3, beginning at

line 28, the interpolator compression in the prior art MPEG-4 binary format scene (BIFS) needs scalar quantization as shown in Figure 4A, for example. The prior art compression process of Figure 4A is not only applied to interpolators but all elements that need compression in the BIFS. In the inverse of the compression order, an animation path is reconstructed through the scalar dequantization unit 70, using coded bitstream input to the prior art reconstruction apparatus of Figure 4B. In the apparatuses of Figures 4A and 4B, keys and key values of the interpolators are compressed in the uniform way, without consideration of the characteristics of each kind, so compression cannot be maximized.

The Bourges-Sevenier patent publication in relevant part is similar in scope to this description prior art. Specifically, as described at various portions of the prior art, data field key and key values are described. At paragraph 35, linear interpolators are used "to transfer all key and key value data from a server to a remote unit." In Figure 3, a single decoder 304 is employed, and, in reading the Bourges-Sevenier patent publication in its totality, it is apparent that there is no recognition that key and key values should be separately encoded and decoded. In particular, paragraph 0085, identified in the Office Action, identifies that I-frames contain raw quantized field values, and P-frames contain arithmetically encoded difference field values. It also discloses that a BIFS-Anim is a key-frame based system, meaning that a key can be only I or P. Consequently, all field values must be I or P coded and each field is animated at the same frame rate.

These indicate, at least inferentially and collectively, that the key values and the keys of the interpolators are compressed in the uniform way, just as described with respect to the prior art and applicants' own description of prior art at page 4, for instance.

In marked contrast, the present invention as recited in each of the independent claims 1, 8, 11 and 12, all recite, in broad brush, that the key values are coded separately from the keys. Embodiments of the present invention can maximize compression by recognition of the different types of data.

It should be apparent that the applied art neither appreciates nor teaches anything that would cause one skilled in the art to separate the coding of keys from the coding of key values, as is done in embodiments of the present invention.

These above-mentioned independent claims have been amended to bring out this distinction even further, though it is submitted that a detailed reading of the claims in light of the original specification would have made this clear to one skilled in the art.

The dependent claims have distinctions which further separate the present invention from the applied art. These distinctions will not be discussed for the sake of brevity.

However, with respect to claim 18, it is noted that the method of extracting break points as recited in claim 18 involves selecting two break points on opposite end points of the original animation path among break points in the animation path. One additional break point among the remaining break points, excluding the two end point break points, is also selected. Key values are then interpolated of the

remaining break points excluding the selected break points using the selected break points. The approximated path is based on the selected break points and the interpolated key values in selecting an approximated animation path which has the smallest path difference between the original animation path and the approximated animation path in selecting break points corresponding to the selected animation path. This process is repeated until the path difference is less than an allowable difference. This process is illustrated in Figures 8A through 8H.

In the section of the Bourges-Sevenier patent publication relied upon in the Office Action, Bezier curves are used to construct an arbitrary curve. It should be noted that the "control points" are not break points insofar as the control points are not on the animation path and do not represent breaks in the continuous path line. Instead, there are four control points that are selected such that using cubic Bezier curves the animation path can be generated using a reiterative process. Stated differently, a Bezier curve technique is employed, rather than the method of selecting various break points and interpolating further break points therebetween such that the difference in path is minimized as recited in claim 18.

In light of the foregoing, applicants respectfully request reconsideration and allowance of the above-captioned application. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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